Waterbody: Lake Cascade

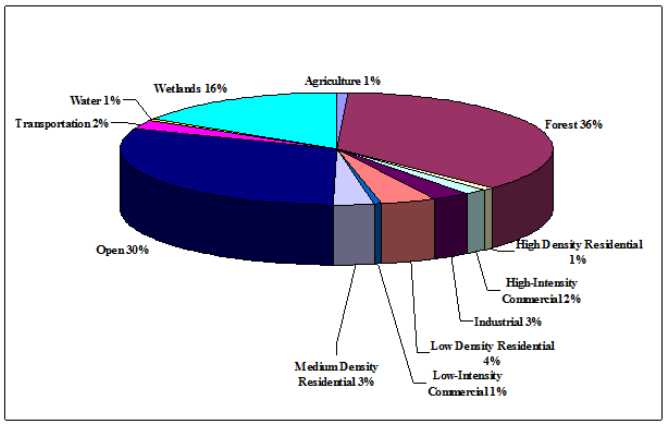
Basin: Lake Munson

The Bradford Brook Chain of Lakes is composed of the cypress rimmed Lakes Bradford, Hiawatha and Cascade and is located in western Leon County. Water typically flows east via Bradford Brook into Lake Cascade. Lake Hiawatha receives flow from Lake Cascade via a culvert beneath Capital Circle Southwest. Much of the water entering Lake Bradford is via Lake Hiawatha, though at times Grassy Lake flows into Lake Bradford. On occasion, flow is reversed and Lake Bradford flows into Lake Hiawatha which then flows into Lake Cascade. In addition, groundwater sources of flow are possible.

As shown in the following pie chart, approximately 17% of land uses in the 11,148 acre Bradford Brook watershed are agricultural, residential, industrial, commercial or transportation. Increases in stormwater runoff, and waterbody nutrient loads can often be attributed to these types of land uses.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat



or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (*e.g.,* recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Lake Cascade has an active sinkhole and is affected by drought conditions more than either Bradford or Hiawatha. Due to drought conditions, sampling has been intermittent and results remain inconclusive.

Methods

Surface water, sediment samples and a Lake Vegetation Index (LVI) were collected to determine the health of Lake Cascade and met the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The nutrient thresholds and results are found in Table 1. Due to low water, the numeric nutrient criteria data requirements could not be calculated for years 2007-2012. According to FDEP requirements, Numeric Nutrient Criteria (NNC) (expressed as an annual geometric mean) cannot be exceeded more than once in a three year period. No numeric nutrient criteria were exceeded, but there was a large increase in total nitrogen in 2013. Increased levels of nitrogen could be attributed to the decay of terres-

trial plants that grew in the lake bottom during the drought or possibly stormwater runoff associated with the southwest Capital Circle widening.

Table1. FDEP's chlorophyll *a*, total nitrogen and phosphorus criteria for lakes applied to Lake Cascade. Due to low water the numeric nutrient criteria data requirements could not be calculated for years 2007-2012.

Colored Lake	Chlorophyll-*a* (20 µg/L)	Total Nitrogen Threshold 1.27-2.23 mg/L	Total Phosphorus 0.05-0.16 mg/L
2004	2.8	0.21	0.01
2005	2.4	0.43	0.01
2006	3.6	0.38	0.01
2007-2012	-	-	-
2013	4.7	1.16	0.02
2014	4.5	0.79	0.02

Metals

Lead levels in Lake Cascade exceeded Class III water quality standards in 2014 and are thought to be due to both relict and potentially current sources. Relict anthropogenic sources of lead in the area include a former shooting range and the former Dale Mabry airfield, while possible current sources include the Tallahassee Regional Airport (aviation fuel). The acidic nature of these lakes causes increased lead due to the enhanced solubility of lead under low pH conditions. Because acidic systems like the Bradford Chain of Lakes are more susceptible to metals contamination, exceedance levels tend to be lower than a similar metal level in a more alkaline system.

Click here for more information on metal levels in Leon County waterbodies.

Floral Assessment

The Lake Vegetation Index score for Lake Cascade was 90, placing the lake's vegetative community in the exceptional category.

Thirty six plant species were found during the survey. The native species, pond cypress (*Taxodium ascendens*), was the most dominant species in the lake, followed by maidencane (*Panicum hemitomon*). Other native shoreline vegetation included red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*) and swamp tupelo (N*yssa sylvatica* var*. biflora*).

Unfortunately, Chinese tallow tree (*Sapium sebiferum*), listed as a Category I Invasive Exotic by the Florida Exotic Pest Plant Council is an invasive exotic that was found at Lake Cascade.

Click here for more information on the Lake Cascade LVI.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Cascade met the nutrient thresholds for the East Panhandle Region; and the floral community is considered "exceptional" by the LVI. Lead levels in Lake Cascade have exceeded Class III water quality standards and are thought to be due to both relict and potentially current sources.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and resources for more information

www.LeonCountyFL.gov/WaterResources

Click here to access the results for all water quality stations sampled in 2014.

Click here for map of watershed – Sample site BOC.

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